AMENDMENTS TO THE CLAIMS

1. (Currently Amended)

~~A~~ In combination, a restrictor ~~for use in~~ and a pulsation-absorbing flexible pipe for a pressure fluid device, said restrictor comprising a generally cylindrical body having a central flow-through passage open at its opposite axial ends, said flow-through passage being constructed in the form of a venturi having a flow-direction-convergent inlet passage leading into a constant diameter throat passage that in turn leads into a flow-direction-divergent outlet passage, the configuration of ~~the~~ said venturi inlet, throat and outlet passages being constructed and arranged with a shallow taper angle in said inlet and outlet passages and said throat passage having a relatively short axial length much less than that of either said inlet or said outlet passages and such that ~~turbulence in the outlet of the restrictor~~ under the pressure and fluid flow conditions in which the restrictor is adapted to be used ~~minimizes~~ turbulence is minimized in ~~the~~ said restrictor outlet passage and/or immediately downstream thereof.

2. (Currently Amended)

The restrictor and pipe combination of claim 1 wherein said restrictor body is constructed entirely of plastic material injection molded in final form ~~to the shape and configuration specified in claim 1~~.

3. (Cancelled)

4. (Currently Amended)

The restrictor and pipe combination of claim 1 wherein the taper angle of said outlet passage ranges between approximately 4° up to approximately 15°.

5. (Currently Amended)

The restrictor and pipe combination of claim 1 wherein said pipe comprises a rubber composite hose and wherein the external surface of the restrictor is of constant diameter and is interrupted in a central region axially thereof by a series of grooves and intervening lands with sharp intersections, said grooves being of relatively shallow radial depth to thereby adapt the restrictor for being surrounded by ~~a flexible~~ said hose clamped thereto and sealed by engagement with the grooves and lands of the inner wall of the hose.

6. (Currently Amended)

The restrictor and pipe combination of claim 1 in combination ~~with~~ wherein said pipe comprises a hose assembly with said restrictor installed therein and operable in reducing turbulence in fluid when operated in a hydraulic system, said hose assembly comprising a compliant hose section having a wall defining a passage extending from a first end to a second end and having a predetermined inner diameter, said wall being formed of a compliant material

permitting volumetric expansion of said passage in response to an increase in pressure in the fluid,

said flow restrictor being operably disposed in said hose section between said ends for communicating fluid flowing therein from said first end to said second end of said hose section via said flow-through passage, said venturi throat having a diameter smaller than said inner diameter of said hose section to thereby restrict alternating components of said fluid flow between said ends of said hose section, said venturi restrictor inlet, throat and outlet passages being configured to operate as a non-turbulent flow venturi under the conditions existent in the operation of the hydraulic system.

7. (Original)

The combination of claim 6 wherein said restrictor is held fixed in said hose section by a clamp member encircling the outside of said hose section in registry radially with said restrictor and exerting squeeze forces on said hose.

8. (Original)

The combination of claim 7 wherein the external surface of said restrictor has a series of shallow grooves and intervening lands with sharp corners at their intersection with adjacent flanking grooves.

9. (Original)

The combination of claim 8 wherein said restrictor is made of plastic material and said clamp is of the hose clamp-type in which said squeeze force is developed by circumferentially tensioning said clamp in final assembly with said hose section and restrictor.

10. (Original)

The combination of claim 8 wherein said restrictor is made of relatively high strength material, such as metal or high melting point filled plastic material, and said clamp comprises a metal band cold work squeeze-crimped with relatively high forces around said hose into a permanently deformed hose constricting shape.

11. (Original)

The combination of claim 6 wherein said restrictor is coupled at its outlet in fluid communication with the inlet of a tuning cable conduit extending co-axially with said hose section downstream of said restrictor outlet in inwardly spaced relation to a surrounding interior wall of said hose section.

12. (Original)

The combination of claim 11 wherein said restrictor and said tuning cable conduit are each made of plastic material and are coupled by being telescopically joined and plastically welded together.

13. (Currently Amended)

The combination of claim ~~11~~ 6 wherein said hydraulic system comprises a hydraulic power steering system having a hydraulic pump with its output communicating with a power steering gear via said first-mentioned hose section, said restrictor ~~and tuning cable~~ thus being combined with said system and operable in the high pressure side thereof.

14. (Currently Amended)

The combination of claim 13 wherein said system has a return line operably communicating the outlet of said gear with said pump via a second hose section and containing another venturi restrictor therein similar to said first-mentioned restrictor and operable in the low pressure side of said system to assist in pressure balancing said power steering system and without creating audible hiss-like noise therein.

15. (Original)

A method of eliminating turbulence-induced noise in a pulsation-absorbing flexible pipe for a pressure fluid device adapted to be connected between a pressure fluid-feeding device and a working device operated by the pressure fluid discharged from the pressure fluid-feeding device wherein the flexible pipe has a restrictor positioned inside the bore of the flexible pipe between the ends of said flexible pipe and having a flow-through bore,

said method comprising the step of:

(a) providing said restrictor as a venturi restrictor wherein the flow-through bore in said restrictor has a venturi tube cross section with a tapered flow-direction-convergent inlet bore leading to a constant diameter throat which in turn leads to a tapered flow-direction-divergent outlet, and

(b) designing said venturi inlet, throat and outlet so as to conduct fluid therethrough in the operating system of said pressure fluid device by matching the characteristics of the fluid, the operational pressures, fluid density and other system parameters such that the venturi operates below the lower critical value of the Reynolds number of the fluid flow through the restrictor to thereby minimize or eliminate noise by minimizing or eliminating turbulence in the fluid in the restrictor outlet and/or exiting immediately downstream from the venturi restrictor.

16. (Original)

The method of claim 15 wherein said restrictor body is constructed entirely of plastic material injection molded in final form to the shape and configuration specified in claim

17. (Original)

The method of claim 15 wherein the taper angle of said restrictor outlet ranges between approximately 4° up to approximately 15°, and hence the included divergence angle of the outlet ranges between approximately 8° up to approximately 30°.

18. (Original)

The method of claim 15 including the further step of installing said restrictor in said pipe, and wherein said pipe comprises a hose made of elastomeric material, installing said hose in a hydraulic system containing said device, and wherein the external surface of the restrictor is of constant diameter and is interrupted in a central region axially thereof by a series of grooves and intervening lands with sharp intersections, said grooves being of relatively shallow radial depth, the restrictor being surrounded by the flexible hose, and clamping the restrictor fixed in the hose so as to be sealed by engagement of the grooves and lands of the inner wall of the hose.

19. (Original)

The method of claim 18 wherein said restrictor is made of plastic material and said clamp is of the hose clamp-type in which hose squeeze force is developed on the restrictor by circumferentially tensioning said clamp in final assembly with said hose section and restrictor.

20. (Original)

The method of claim 15 wherein said flexible pipe comprises a hose section and said restrictor is coupled at its outlet in fluid communication with the inlet of a tuning cable conduit extending co-axially with said hose section downstream of said restrictor outlet in inwardly spaced relation to a surrounding interior wall of said hose section, and wherein said restrictor and said tuning cable conduit are each made of plastic material and are coupled by being telescopically joined and plastically welded together.

21. (New)

The restrictor of claim 1 wherein said body has a cylindrical exterior surface with an outside diameter (O.D. dimension) generally ranging from about 10.033 mm down to about 8.76 mm, wherein the axial cross sectional configuration of the interior of the restrictor, as defined by said inlet, throat and outlet passages, is symmetrical about all axes, wherein the respective taper angle of said inlet and outlet passages is in the range of about 4° to about 15°, wherein the internal diameter dimension of said throat passage is in the range of about 2.64 mm

to about 4.57 mm, wherein the axial length of said throat passage is in the range of about 0.76 mm to about 12.2 mm, wherein the maximum I.D. of said inlet passage at its inlet end is the same as that of said outlet passage at its outlet end and is about 7.493 mm, wherein the external surface of said restrictor is interrupted in its central region by a series of shallow grooves that define therebetween a series of equally spaced and equal axial length lands, the axial length dimension of each said groove being in the range of about .127 mm to about 1.651 mm, the axial length dimension of each said land being in the range of about .76 to about 2.667 mm, and wherein the depth dimension of each said groove being in the range of about .127 mm to about 406 mm.

22. (New)

The combination of claim 6 wherein said hydraulic system comprises a hydraulic power steering system having a hydraulic pump with its input communicating with the output of a power steering gear via said first-mentioned hose section thereby operable as a fluid return line in said system, said first-mentioned restrictor thus being combined with said system and operable in the low pressure side thereof.

23. (New)

The combination of claim 22 wherein said hydraulic pump has its output communicating with the input of said power steering gear via a second hose section constructed like said first hose section, and a second restrictor constructed like said first-mentioned restrictor

4 is operably disposed in said second hose section and is thus combined with said system and

5 operable in the high pressure side thereof.